



Module Objective

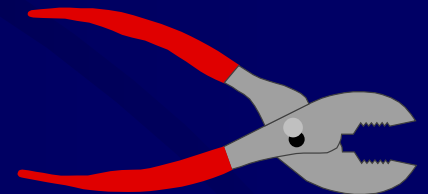
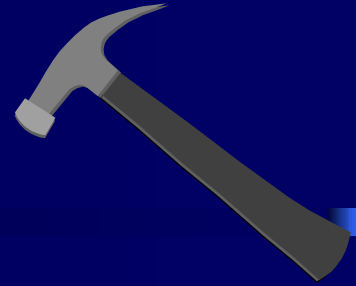


- Explain Environmental Management System Concepts
 - What is an EMS ?
 - What are the benefits of EMS ?
- Discuss DOT EMS Design
 - Starting an EMS
 - DOT EMS Framework
 - 12 Step EMS Development Process

What is an EMS?

An EMS is a tool for an organization to:

- Control the impacts of its activities on the environment
- Manage those activities to continually improve environmental performance
- Set environmental performance measures
- Enables consistent and repeatable performance



Stages in an EMS

The NCDOT EMS Framework is based on the “Plan, Do, Check, Act” model of continuous improvement

The EMS must:

1. Meet or exceed regulatory requirements
2. Promote pollution prevention
3. Show a commitment to continual improvement

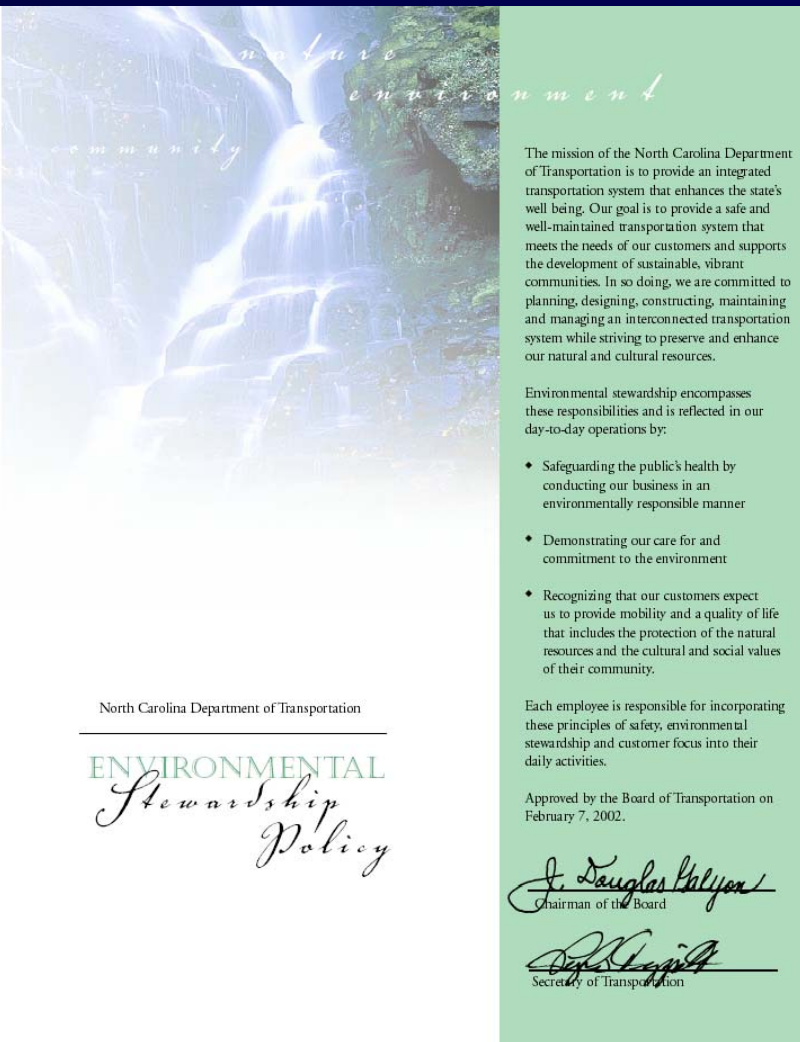


Benefits of EMS

- Reduce Cost
- Ensure Environmental Compliance
- Reduce Accidents
- Increase Public Confidence
- Reduce Waste Generation & Haz Mats
- Reduce Energy Consumption
- Improve Employee and Community Health



Environmental Stewardship Policy



- In February 2002 NCDOT established an Environmental Stewardship Policy as the driver for implementing and improving its environmental performance.
- Safeguards the public's health by conducting our business in an environmentally responsible manner.
- Demonstrates our care for and commitment to the environment.
- Provides mobility and a quality of life that includes the protection of the natural resources and the cultural and social values of their community.

Getting Started

- Gain Management Commitment
- Play an active, visible role in the EMS implementation process
- Provide resources, promote employee awareness, and motivation
- Evaluate the organization's operations and activities



Form the EMS Team

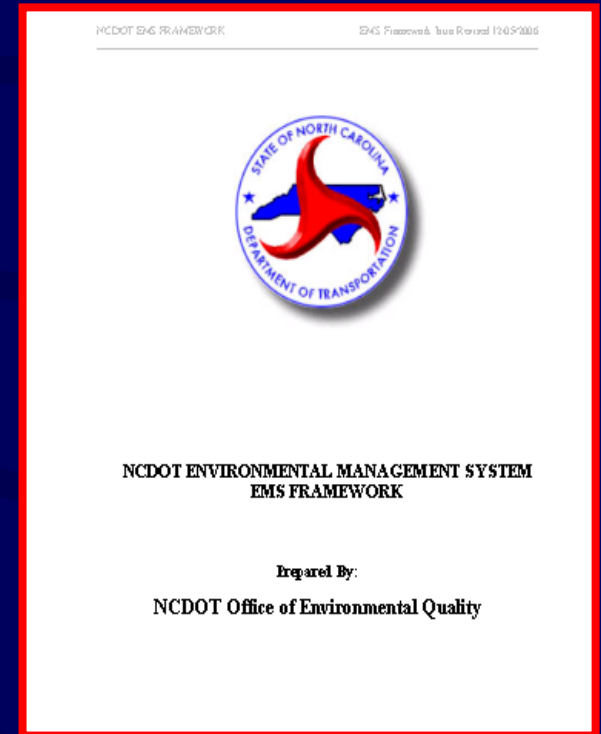
- The EMS Team is selected by the management of the organization implementing the EMS.
- The team is comprised of key stakeholders from within the department and from other departments and organizations that have significant interactions with the environmental aspects of the department's activities, products, or services.



- ✓ **Manage EMS documentation**
- ✓ **Develop procedures to support EMS policy**
- ✓ **Look for opportunities for improvement**

NCDOT EMS Framework

- NCDOT's Framework was developed in December 2006.
- Prepared in compliance with the ISO 14001:2004 model and can be used to support the development and maintenance of a complete and effective EMS.
- Intended to be a reference for EMS implementation to promote standardization within NCDOT.



EMS Framework Contents

The EMS Framework contains 18 sections and 101 pages of EMS support documentation

The Framework includes 37 required EMS documents

Section	Content	ISO Section	EMS Documents	Page
	Purpose and Use			3
	Definitions & Acronyms			9
Section 1	Scope Definition	4.1	NCDOT-L1-GenOps-001	13
Section 2	Environmental Policy	4.2	NCDOT-L1-GenOps-002 NCDOT-L4-GenOps-002a NCDOT-L4-GenOps-002b	15 17 18
Section 3	Environmental Aspects & Impacts	4.3.1	NCDOT-L2-GenOps-010 NCDOT-L4-GenOps-010a	20 26
Section 4	Legal and Other Requirements	4.3.2	NCDOT-L2-GenOps-011 NCDOT-L4-GenOps-011a	28 30
Section 5	Objective, Target, Management Programs	4.3.3	NCDOT-L2-GenOps-012 NCDOT-L2-GenOps-012a	32 35
Section 6	Resource, Roles, Responsibility, Authority	4.4.1	NCDOT-L2-GenOps-013 NCDOT-L4-GenOps-013a	37 39
Section 7	Competence, Training Awareness	4.4.2	NCDOT-L2-GenOps-014 NCDOT-L2-GenOps-014a	41 43
Section 8	Communication	4.4.3	NCDOT-L2-GenOps-015 NCDOT-L2-GenOps-015a	45 47
Section 9	Documentation Control of Documents	4.4.4 4.4.5	NCDOT-L2-GenOps-016 NCDOT-L4-GenOps-016a NCDOT-L4-GenOps-016b NCDOT-L4-GenOps-016c	54 58 59 61
Section 10	Operational Control	4.4.6	NCDOT-L2-GenOps-017	63
Section 11	Emergency Preparedness and Response	4.4.7	NCDOT-L2-GenOps-018	65
Section 12	Monitoring and Measurement	4.5.1	NCDOT-L2-GenOps-019 NCDOT-L2-GenOps-019a	67 70
Section 13	Evaluation and Compliance	4.5.2	NCDOT-L2-GenOps-020	72
Section 14	Nonconformity, Corrective and Preventive Action	4.5.3	NCDOT-L2-GenOps-021 NCDOT-L4-GenOps-021a NCDOT-L4-GenOps-021b	74 77 79
Section 15	Internal Audits	4.5.5	NCDOT-L2-GenOps-023 NCDOT-L4-GenOps-023a NCDOT-L4-GenOps-023b NCDOT-L4-GenOps-023c NCDOT-L4-GenOps-023d NCDOT-L4-GenOps-23e	81 84 86 88 90 92
Section 16	Management Review	4.6	NCDOT-L2-GenOps-024	94
Section 17	Vendor Compliance Agreement (Sample)		NCDOT-L4-GenOps-025 NCDOT-L4-GenOps-25a	97 99
Section 18	NCDOT Document List			101

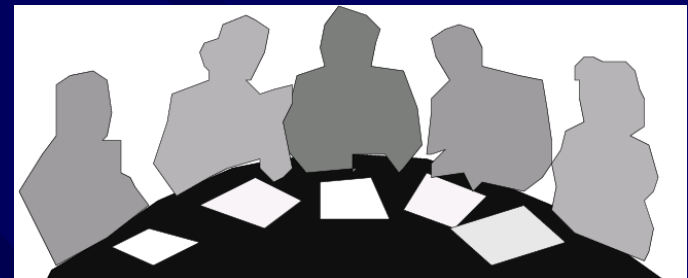
Estimated EMS Timeline

EMS Elements	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Step 1 Roles and Responsibilities	■											
Step 2 Identify Legal Requirements	■	■										
Step 3 Identify Aspects and Impacts		■	■									
Step 4 Establish Objectives and Targets			■	■								
Step 5 Identify Operational Controls				■	■							
Step 6 Monitor and Measurement Plans					■	■						
Step 7 Corrective Action Planning						■						
Step 8 Establish a Communication Plan							■					
Step 9 Establish Training Programs								■	■			
Step 10 Emergency Preparedness Plans						■		■				
Step 11 Procedures for Document Control						■	■	■	■	■		
Step 12 Perform EMS Audits											■	
Management Review						■						■

Step 1

Establish Roles & Responsibility

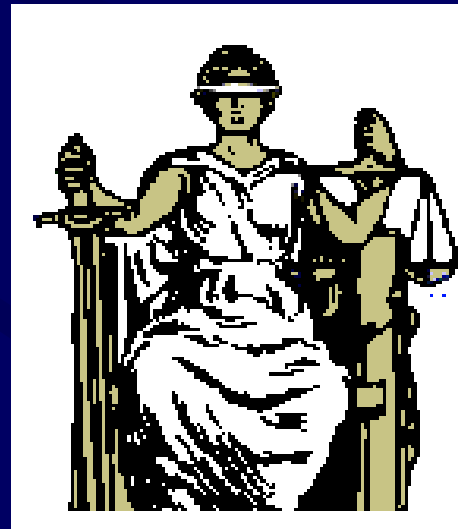
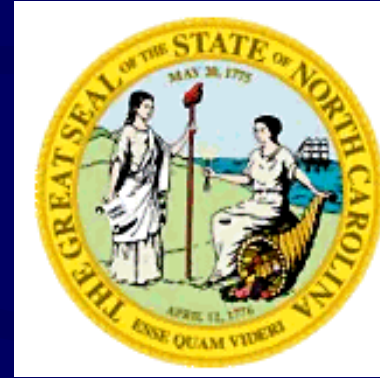
- **EMS Program Team:** Establishes & maintains EMS
- **EMS Team Leader:** Chairs EMS Program Team, manages EMS resources
- **EMS Team Members :** Provides resources, maintain EMS documentation



Step 2

Identify Legal & Other Requirements

- Compile a list of relevant environmental laws, regulations, ordinances, permits, and other requirements
- Review annually for compliance
- Establish plans to achieve full compliance



Step 3

Identify Environmental Aspects & Impacts

Aspect - Element of an organizations activities, products, or services that can interact with the environment:

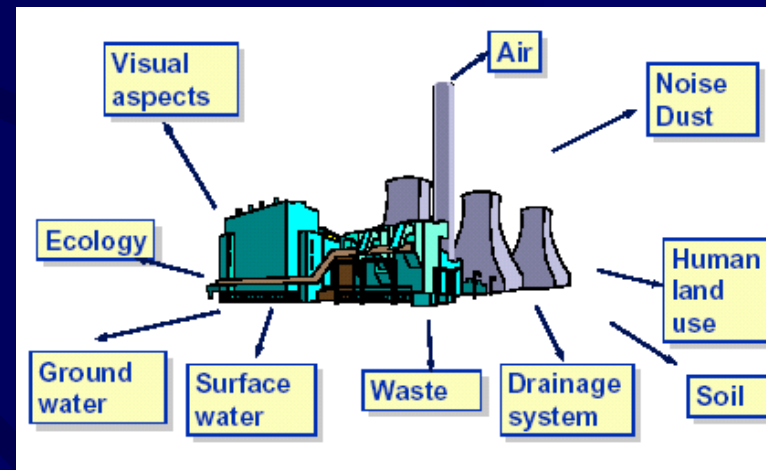
Waste disposal, Water and land use, Dredging, Construction

Impact - Any change (adverse or beneficial) resulting from an organization's activities, products, or services:

Reduced water supply, Erosion, Air pollution, Increase in Landfill

Develop a list of aspects and impacts

- Determine which are significant
- Significant aspects form the basis for determining EMS objectives and targets

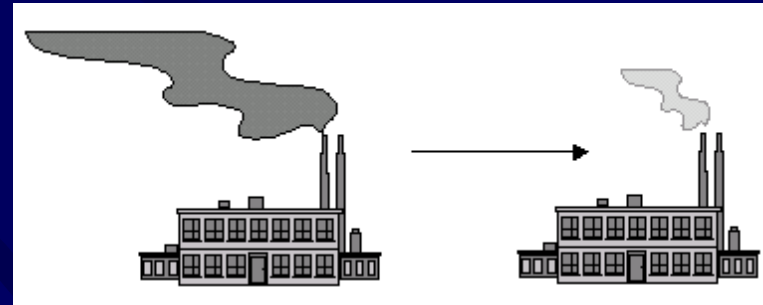
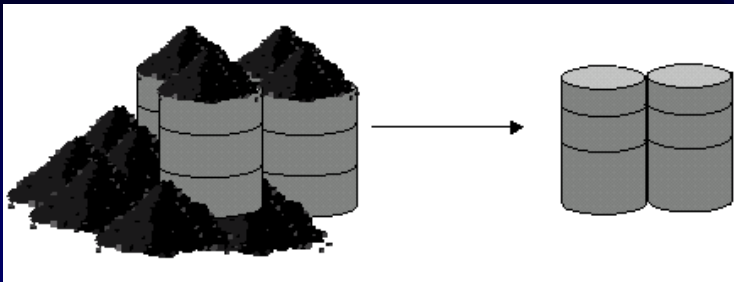


Step 4

Establish Objectives & Targets

Environmental objectives and targets are goals your unit sets:

- Should be Consistent with the Environmental Policy
- Meet Legal Requirements / Customer Requirements
- Be Measurable
- Must be Documented



Step 5

Establish Operational Controls

- Identify operations and activities associated with significant impacts and establish controls
- Develop procedures to manage and control significant impacts
- Establish work practices to cover the control of specific activities

Standard Operating Procedures

Log books

Measuring Equipment

Checklists



Step 6

Monitor & Measure

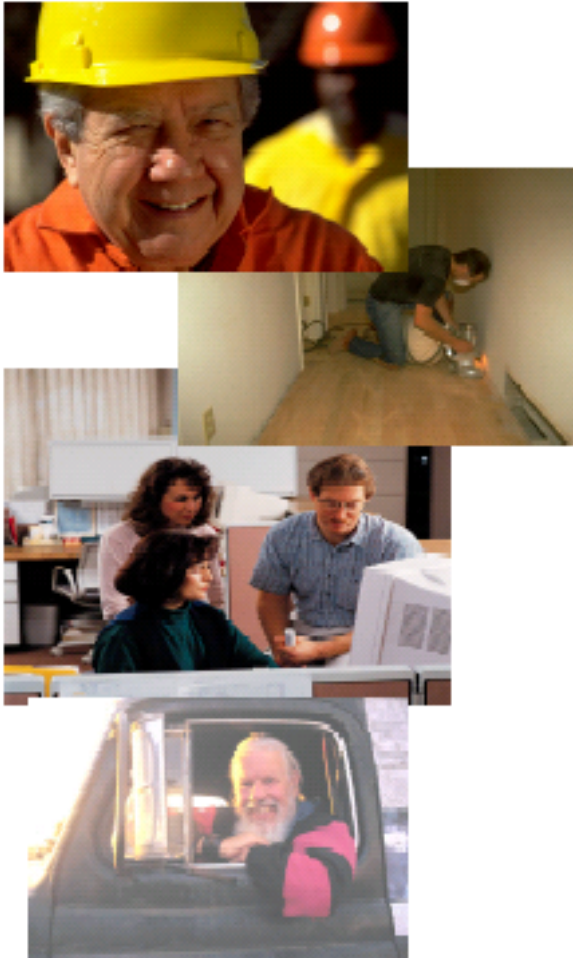
- Identifies key characteristics and processes to track EMS performance
- Provides evidence to management that operational controls are being followed
- Typically relies on indirect measurement techniques:
 - √ Direct observation
 - √ Interviews with operators during internal audits
 - √ Review of completed checklists or forms



Vendor Compliance

Responsibilities

Vendors and Contractors



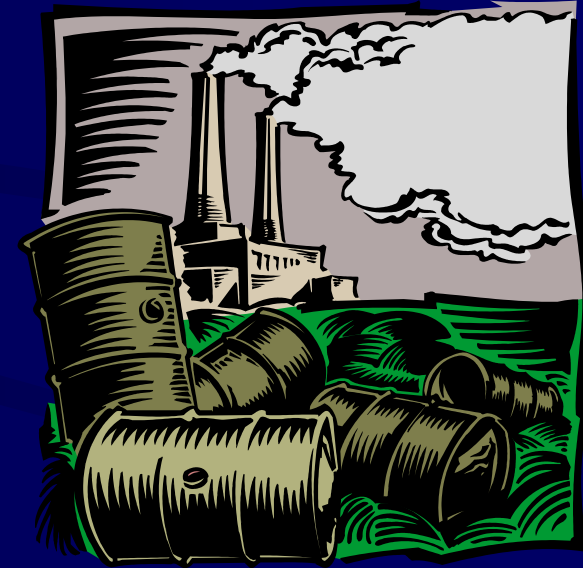
The EMS coordinator should provide oversight to ensure that vendors comply with all EMS related requirements and policies, and provide corrective action for failure to comply

Step 7

Identify Nonconformance

Implement Corrective & Preventive Action

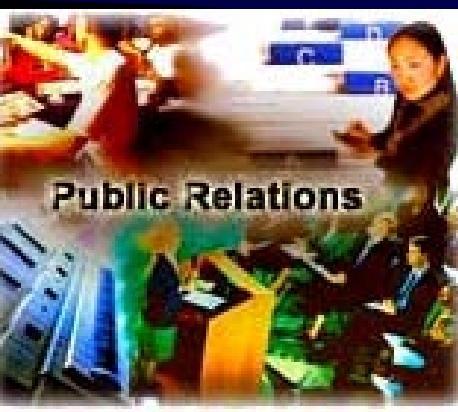
- Identify cause of non-conformance
- Determine appropriate response
- Ensure actions are appropriate to the size of the problem
- Identify personnel responsible for corrective action and their authority
- Implement corrective action



Step 8

Establish A Communication Plan

Ensure that EMS information is communicated to all personnel and that all personnel clearly understand ways they can participate in the EMS:



Step 9

Training

Awareness & Competence

- Identify training needs (Training Matrix)
- Train employees whose work may create significant impacts to environment
- Maintain records of EMS training

NCDOT-L4-GenOps-014b

Training Record / Competence Sign-Off Sheet

Employee Name:		Job Position:	
Department/Unit		Date Hired:	

Skills, Equipment or Awareness Areas	Related to Significant Aspect ? (Y or N)	Check Off Applicable Boxes or Provide Dates if requested								
		Level of Competency (1)					Training Records		Training Records	
		Awareness Level	Competent	Assessment Date	Initials of Assessor	Training Needed ?	Training Date	Instructors Initials	Training Date	Instructors Initials
Emergency Evacuation										
Emergency Responder										
Spill Prevention & Response										
SPCC Required Training										
Hazardous Waste Management										
Hazardous Materials Shipping (DOT)										
Evaporator Operation										
Waste Disposal										
Produce and Verify Product										
EMS Awareness										
Vendor Requirements										

(1) Competency should be assessed by observation, test results, interview, or other means

Step 10

Establish Emergency Preparedness & Response Plans

- Establish and maintain procedures to identify and respond to accidents and emergencies
- Address potential environmental impacts
- Review and revise procedures as necessary after accidents




Step 11

Documentation, Document Control, & Records

Documentation and Document Control describes:

- How documents are generated
- When and how they are approved
- When and how they are reviewed, amended, and re-approved
- Where originals are stored
- How originals or copies may be accessed
- How obsolete documents are destroyed or archived

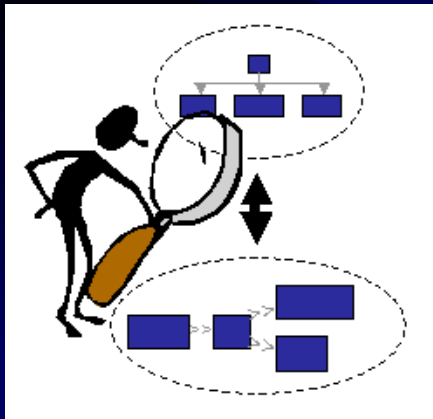


NCDOT Div. or Unit EMS 	Procedure Template - Write your procedure title here	
	<i>Division:</i>	Division or Unit
	<i>(Div /Unit as needed):</i>	Write Department here
	<i>Prepared By:</i>	Your Name, Your Title
	<i>Number & Revision:</i>	NCDOT-L4-Gen Ops-016c <i>Put assigned procedure or form #</i>
	<i>Revision Date:</i>	mm-dd-2006
	<i>ISO 14001 reference(s)</i>	4.x.x <i>Put ISO 14001 cross-reference here</i>
<i>Document references</i>	NCDOT-L4-Unit Name-0xxa <i>Put cross-referenced procedure or form #.</i>	

Step 12

Perform Internal EMS Audit

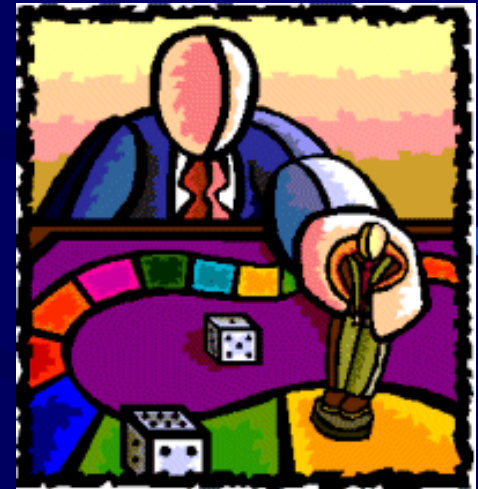
- The main objective is to verify conformance to the Framework and the EMS procedures.
- Audit evidence is typically gathered from interviews, examining documents, observing activities and conditions, results of measurements and tests or other means within the scope of the audit.



Final Step

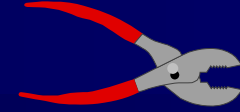
Management Review

- Management Review of the EMS takes place at least annually
- Environmental policy appropriateness
 - EMS effectiveness
 - Changing circumstances influencing EMS
 - Adequacy of roles & responsibilities
 - Achievement of objectives & targets
 - Adequacy of resources
 - Results of legal review
 - Results of compliance and EMS audits
 - Monitoring results
 - Improvement in EMS during last year




Summary

- An EMS is a tool for an organization to control the the impacts of its activities on the environment.
- The EMS must meet or exceed regulatory requirements, must promote pollution prevention, and must show a commitment to continual improvement.
- The EMS Team is comprised of key stakeholders from within the department and from other departments and organizations.
- The NCDOT EMS Framework is intended to be a reference for EMS implementation to promote standardization within NCDOT.



Summary

- Document control procedures exist to ensure that documentation revisions are distributed and outdated versions are removed promptly and methodically.

NCDOT Div. or Unit EMS		Procedure Template - Write your procedure title here	
	Division: (Div./Unit as needed):	Division or Unit Write Department here	
	Prepared By:	Your Name, Your Title	
	Number & Revision:	NCDOT-LA-Gen Ops-016c <i>Put assigned procedure or form #</i>	Revision #
	Revision Date:	mm-dd-2006	Page 1 of 1
	ISO 14001 reference(s)	4 x x <i>Put ISO 14001 cross-reference here</i>	
	Document references	NCDOT-LA-Unit Name-0000 <i>Put cross-referenced procedure or form #</i>	

- EMS audits ensure that the EMS has been properly implemented and is being maintained.

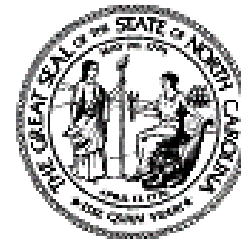


- Management reviews are conducted at least annually to ensure suitability, adequacy, and effectiveness of the EMS.



Contact Information

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